Scientists' Letters to Students

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This investigation consists of two interrelated investigations. Soil Characterization, led by Dr. Elissa Levine, examines soil properties. Soil Moisture, led by Dr. Jim Washburne, examines the moisture in the soil.

Hello Students!

I am Elissa Levine and I am a Soil Scientist for the National Aeronautics and Space Administration (NASA). I am excited to be working with you.

People ask me, "Isn't soil just dirt? Who cares?" It's my favorite question. We take soils for granted, yet soils are among our most important natural resources. The ecosystem depends critically on soils. Soils allow water, energy and heat to flow through them, and they are essential for our food and clothing. We walk on soils, play on them, drive on them and construct homes, schools and buildings on them.

As a girl, I was fascinated by the color of soil, the way it felt, and all the rocks, roots and creatures living in it. As I grew up, I became concerned with feeding people and the proper use of our natural resources. So I studied soils.

What does a Soil Scientist do at NASA? I work at the Goddard Space Flight Center in Maryland. Our orbiting spacecraft carry sensors that send us images of the Earth, and I help to explain what the images reveal about the Earth's surface.

Together, we will determine what your soil looks like, why it looks that way, and how we can manage it for a healthy environment. You will closely examine soil samples from your study site.

Scientists will use your data to learn about the different soils across the Earth. Your data will help us to better interpret our satellite images and to better understand how systems interact on Earth and to predict what will happen to the soil in the future.

Have fun digging and exploring!

Elissa Levine

Dr. Elissa Levine
NASA/Goddard Space Flight Center
Greenbelt, Maryland, U.S.A.

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Dear Students,

Hi, my name is Jim Washburne. I am a research hydrologist at the University of Arizona in Tucson. Hydrology is the study of water and its movement through the atmosphere, soil and the underlying rocks. I am the scientist responsible for GLOBE soil moisture measurements.

When I was young, I was fascinated by how scientists discovered and tracked the movement of continents and the spreading of ocean floors from mid-ocean ridges. I feel the same level of excitement today in studying the Earth's water. New discoveries are being made daily but many questions remain unanswered.

People used to study the Earth piece by piece – looking at either soil, water, air, plants or animals. Now that we better realize how complex the Earth is, we know that it is important to study the whole system and the interconnections between the parts.

I am trying to understand how the water cycle works in dry areas of the world by asking questions like:

- When it rains, how much water remains in the soil and for how long?
- How does human activity affect the water cycle?
- How accurate are satellite data and can they be used in hydrologic models?

Scientists use sophisticated instruments and even satellites to measure soil moisture remotely. Only satellite data when linked with direct, long-term, hands-on ground observations can give us the valuable information we require. This is why we need your help in the field to make direct measurements of soil moisture. By monitoring your GLOBE sites, you will tell scientists what is actually happening on the ground.

Each one of you can make a difference by making good observations and asking challenging questions. I look forward to working with you. Have fun exploring, measuring, and making sense of your data.

Sincerely,

Jim Washburne

Dr. James Washburne
Department of Hydrology and Water Resources
University of Arizona
Tucson, Arizona 85721-0011 USA
phone (520) 621-9944
fax: (520) 621-1422
email: jwash@hwr.arizona.edu